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## Routine Violence Risk Assessment in Community Forensic Mental Healthcare

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**We developed a method for periodic monitoring of violence risk, as part of routine community forensic mental healthcare. The feasibility of the method was tested, as well as its predictive validity for violent and risk enhancing behavior in the subsequent months. Participants were 83 clients who received forensic psychiatric home treatment, and six case managers. The method proved feasible and informative. Violent and risk enhancing behavior could be predicted to a reasonable extent ( $AUC = .77$ , 95%  $CI = .70-.85$ ; respectively  $.76$ ,  $.70-.82$ ). Dynamic risk factors had an incremental predictive value over static factors in the prediction of violent behavior ( $OR = 4.30$ ,  $1.72-10.73$ ). The professional judgment of the case managers added further predictive power ( $OR = 2.16$ ,  $1.40-3.33$ ), corroborating the structured professional judgment approach. Finally, unmet needs for care of the client were associated with a reduced risk for violent and risk enhancing behavior ( $OR = .80$ ,  $0.69-0.93$ , and  $0.84$ ,  $0.72-0.97$ ). This latter finding suggests that in cases with unmet needs the case manager saw opportunities to do something about the risk. Currently we are testing whether using the method actually prevents violence. Copyright © 2009 John Wiley & Sons, Ltd.**

### INTRODUCTION

Violence risk assessment research and practice have been dominated by the problem of violence prediction for release decisions. The emphasis has been on one-time assessment of enduring factors that identify clients who pose a high long-term risk for violence. What has been neglected, however, is the problem of ongoing risk monitoring for clients who receive treatment or aftercare in the community. This setting calls for a different approach to violence risk assessment: one that focuses on dynamic factors within the individual and his or her situation that determine the short term risk for

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violence and that identify needs for risk management and treatment (Dvoskin & Heilbrun, 2001; Douglas & Skeem, 2005).

We developed a violence risk assessment method for community forensic mental healthcare, which was modeled after the routine outcome assessment (ROA) approach in general mental healthcare (Slade, 2002). In this approach, treatment outcome—including client functioning—is assessed regularly, as part of routine clinical practice, and is evaluated on the level of the individual client. Its purpose is to monitor the treatment progress of the client and to identify any needs for adjustment of care. This fits well with the above noted need for ongoing violence risk monitoring and management for outpatient forensic mental health clients.

Two approaches to ROA should be distinguished: one in which the outcome assessments take place outside client–clinician contacts (see, e.g., Marshall et al., 2004; Slade et al., 2006) and one in which they are incorporated into ‘routine’ client–clinician contacts (see, e.g., Priebe et al., 2007; Van Os et al., 2004). We modeled our routine violence risk assessment method after the latter approach, because this approach showed positive short term effects on client–clinician communication and treatment (Van Os et al., 2004) and long term improvements in client satisfaction, quality of life, and needs for care (Priebe et al., 2007). Furthermore, the approach is explicitly intended to intervene in client–clinician communication and to facilitate ‘shared decision making’ in individual care planning (Priebe et al., 2002): an approach that is expected to contribute to client satisfaction, commitment, and treatment outcome (Fenton, 2003; Hamann, Leucht, & Kissling, 2003; Joosten et al., 2008).

The aims of the present study are to test the feasibility of our method of routine violence risk assessment in community forensic mental healthcare and to test its predictive validity. Feasibility is examined both by the number of assessments realized compared with the number scheduled and by the qualitative evaluation of the assessment method by the case managers performing the assessments. The predictive validity is examined by the strength of the association between the risk assessments and the occurrence of any incidents of violent or risk enhancing behavior by the client in the subsequent months. In addition, it is tested whether dynamic factors add predictive value to static, historical factors in the short term prediction of violence by outpatient forensic clients, as suggested by the ‘risk management/risk reduction’ approach (Dvoskin & Heilbrun, 2001; Douglas & Skeem, 2005).

## METHOD

### Study Design

Routine violence risk assessment was introduced into the regular care of a group of community forensic mental health clients. The case managers of these clients were asked to assess the violence risk of their client every three months. These assessments had to be based on all available information. However, to inquire about any recent problems in client functioning, the case manager was instructed to conduct a semi-structured interview with the client before assessing the violence risk. This interview was modeled after the Camberwell Assessment of Need—Forensic Version (CANFOR; Thomas et al., 2003), which covers 25 areas of the client’s life. In addition, the case managers were asked to assess the psychiatric and social functioning of the client, and

the needs for care in the 25 areas of the client's life. Case managers were free to refrain from interviewing the client, if they considered the routine assessment method too upsetting for the particular client or for their relationship with the client.

Apart from the three-monthly assessments, the case managers were asked to report any incidents of violent or risk enhancing behavior by the client in the preceding months. By risk enhancing behavior we mean behavior—such as alcohol abuse or stopping necessary medication—that in itself is not violent or criminal, but that may be considered to increase the risk of such behavior. Risk enhancing behavior was added as outcome to check the generalizability of findings across outcomes, and to guard against laying too much weight on chance findings (Babyak, 2004). Furthermore, in clinical practice incidents of risk enhancing behavior—as of violent behavior—will be used by the clinician as vital information on the client's treatment progress and forms of behavior the clinician will probably want to call the client to account for in treatment.

The qualitative evaluation of the feasibility of the violence risk assessment method was performed by a group interview with the case managers, at the end of the study.

## Participants

Eligible for the study were all 99 clients who received forensic psychiatric home treatment (FPHT) for any length of time between April 1 2003 and July 1 2004 from a community forensic mental health service in the north of the Netherlands. Sixty-one of them had already received FPHT treatment at the start of the inclusion period, for a mean time of 10.9 months (s.d. = 7.1; range 0–21). FPHT is offered to clients who have a lasting need for care and control, both after and instead of inpatient treatment, and for whom care in the home situation is expected to have a surplus value. Not infrequently FPHT is the only form of care accepted by clients who are deemed to have a persistent need for care and control but whose court order has ended. The clients were informed about the study by their case manager and informed consent was requested.

Table 1 shows demographic, judicial, and psychiatric characteristics of the FPHT clients. The clients proved to be predominantly male (95%), and relatively old (mean age 40.1 years). The majority had a history of violent offences (61%), and a significant minority (19%) had committed sexual offences. Nevertheless, almost half of the clients (44%) were not (or no longer) obliged to start the FPHT treatment. Psychiatric disorders were diverse, with substantial comorbidity, especially of substance-related disorders, and two-thirds of the clients had a diagnosis of personality disorder, most notably from the B cluster or 'not otherwise specified'. Sixteen clients did not give informed consent for the study. These clients did not significantly differ from the 83 participating clients on any of the characteristics listed in Table 1 ( $p > .10$ ).

The clients were treated by six case managers, who participated in the study. In addition, the FPHT treatment coordinator performed a number of parallel assessments, to study the inter-rater reliability of assessments. The coordinator saw all new FPHT clients in the intake phase of treatment, and discussed the client's progress with the case manager on a regular basis.

## Violence Risk Assessment

The violence risk of the client was assessed by the case manager on the HKT-30 (Dienst Justitiële Inrichtingen, 2002), which is a Dutch risk assessment measure modeled after

Table 1. Client characteristics ( $n = 99$ )

Characteristic	Distribution
Gender (male)	95%
Age in years (mean; [sd]; range)	40.1; [10.4]; 20–62
Ethnicity <sup>1</sup>	
-native Dutch	78%
-migrant <sup>2</sup>	19%
Marital status <sup>1</sup>	
-married	2%
-divorced	25%
-widowed	1%
-never married	69%
Legal status at start of FPHT	
-criminal treatment order <sup>3</sup>	28%
-civil treatment order	3%
-probation	24%
-no order (voluntary treatment)	44%
Offence history <sup>4</sup>	
-sexual offences (victim <16 years)	11%
-sexual offences (victim ≥16 years)	8%
-violent offences	61%
-arson	8%
-property or drug offences	7%
-no (conviction for) offence	4%
Psychiatric diagnosis on Axis I <sup>5</sup>	
-psychotic disorders	29%
-impulse-control disorders	12%
-paraphilias	9%
-substance-related disorders	37%
-pervasive developmental disorders	11%
-attention deficit and behavior disorders	3%
-other Axis I disorders	16%
-no Axis I disorder	11%
Psychiatric diagnosis on Axis II <sup>5</sup>	
-borderline personality disorder	18%
-antisocial personality disorder	11%
-other Cluster B personality disorder	3%
-Cluster A personality disorder	6%
-Cluster C personality disorder	1%
-personality disorder NOS	27%
-borderline intellectual functioning	9%
-no Axis II disorder	34%

<sup>1</sup>Percentages do not add up to 100%, due to missing data.

<sup>2</sup>At least one parent born outside the Netherlands.

<sup>3</sup>Including leave from hospital order, outpatient order, and conditional acquittal.

<sup>4</sup>Hierarchical categories, in order of presentation.

<sup>5</sup>Multiple categories per person possible.

the HCR-20 (Webster, Douglas, Eaves, & Hart, 1997). As in the HCR-20, the HKT-30 consists of three subscales, addressing historical, clinical, and situational risk factors. However, the HKT-30 places more emphasis on dynamic risk factors than the HCR-20, with 13 clinical risk factors instead of 5, and 6 situational factors instead of 5 (see Table 2). Furthermore, in the HKT-30 the risk factors are scored on five-point scales, compared with three-point scales in the HCR-20, which increases the possibility to express a change in risk. Finally, in a study of violent recidivism of patients discharged from Dutch forensic psychiatric hospitals (Hildebrand, Hesper, Spreen, & Nijman, 2005), the HKT-30 showed somewhat better predictive validity than the HCR-20,

Table 2. Risk factors of the HKT-30

Historical	Clinical	Situational
1. Offence history	1. Insight	1. Agreement on treatment conditions
2. Violation of treatment conditions	2. Active psychotic symptoms	2. Material resources
3. Behavior problems before age of 12	3. Current substance use	3. Constructive daytime activities
4. Victim of violence in youth	4. Impulsivity	4. Independent living skills
5. Care history	5. Empathy	5. Social support
6. Employment problems	6. Hostility	6. Stress
7. Substance use problems	7. Social skills	
8. Psychotic disorder	8. Self-care	
9. Personality disorder	9. Acculturation problems	
10. Psychopathy	10. Treatment readiness	
11. Sexual deviance	11. Taking responsibility for offence	
	12. Sexual preoccupation	
	13. Coping skills	

especially for the dynamic risk factors. For these reasons the HKT-30 was preferred for our routine violence risk assessment method.

For each of the clients, the case manager assessed the historical risk factors of the HKT-30 once, at baseline. The dynamic clinical and situational risk factors of the HKT-30, on the other hand, had to be assessed every three months. These assessments should take into account all available information on the client, including background information such as the assessed historical risk factors, and the information gathered by the case manager in the three-monthly interviews with the client. Mean scores were calculated for the 11 factors of the historical, the 13 of the clinical, and the 6 of the situational subscales of the HKT-30. Finally, in accordance with the structural professional judgment approach (Douglas & Kropp, 2002; Webster *et al.*, 1997), the case manager directly estimated the risk of violent behavior by the client in the next three months, taking account of the assessed risk factors. This final risk judgment had to be expressed on a five-point Likert scale, ranging from ‘very low’ to ‘very high’. The case managers were extensively trained in the use of the HKT-30 and the assessment tools described below.

### Psychiatric and Social Functioning

Psychiatric and social functioning of the client was assessed by the case manager on the Health of the Nation Outcome Scales version for Mentally Disordered Offenders (HoNOS-MDO; Dickens, Sugarman, & Walker, 2007). Again this had to be done three-monthly, and contiguous with the semi-structured interview with the client. The HoNOS-MDO covers the same 12 domains of client functioning as the original HoNOS (namely disruptive behavior, self-injury, drugs, cognitive, physical, and psychotic problems, depressed mood, other mental health problems, and problems with relationships, activities of daily living, living conditions, and occupation), but with examples and wording adjusted to the situation of forensic mental health clients. Client functioning on these domains in the past four weeks was scored on anchored five-point scales, ranging from ‘no problem’ to ‘(very) severe problem’. The additional scale

assessing current need for secure care, in which the HoNOS-MDO differs from the later HoNOS-Secure versions, was not used, because it was considered unsuitable for the Dutch forensic mental health services. A mean score of the 12 HoNOS-MDO items was calculated.

### **Needs for Care**

Needs for care of the client, according to the case manager, were assessed with the Camberwell Assessment of Need—Forensic Version (CANFOR; Thomas et al., 2003). This assessment was incorporated into the semi-structured interview the case manager was asked to conduct every three months with the client. The interview covered the 25 life domains of the CANFOR. For each life domain the case manager was asked to assess whether the client showed any need for care in that domain over the past four weeks, and whether this need was met or not. The total number of needs—met or unmet and out of 25—was calculated, as well as the number of unmet needs.

### **Incidents of Violent or Risk Enhancing Behavior**

Incidents of violent or risk enhancing behavior of the client since the previous risk assessment (or in the previous three months for the first assessment) were reported by the case manager on a standardized Incidents Form. This form listed categories of violent or criminal behavior (including physical violence, verbal aggression, non-verbal aggression, property offences, sexual offences, and arson), and of risk enhancing behavior (including breaking an agreement with the case manager, stopping necessary medication, and drug or alcohol abuse). Apart from the nature of the incident, the case manager was asked to record the frequency of the incident during the period reported on, and to give details of the incidents.

### **Analyses**

The predictive validity of the violence risk assessment method was studied by logistic regression analysis. Separate analyses were performed (1) for the occurrence of any incident of violent or criminal behavior in the subsequent observational period (regardless of the occurrence of any risk enhancing behavior) and (2) for the occurrence of any risk enhancing behavior (regardless of the occurrence of any violent or criminal behavior). The predictors studied consisted of the mean scores on the historical, clinical and situational subscales of the HKT-30, the final risk judgment by the case manager based on the HKT-30, the HoNOS-MDO mean score, and the total numbers of needs and unmet needs as assessed by the case manager on the CANFOR. Both univariate and multivariate associations between the predictors and the outcome variable were studied. The multivariate analyses were performed hierarchically, to study the incremental predictive value of the routinely assessed dynamic factors over and above that of the one-time assessment of historical risk factors. In a first step, the mean score on the historical risk factors was therefore forced into the multivariate predictive model, and in a second step the incremental predictive value of all dynamic factors was studied



simultaneously, by stepwise forward selection of significant predictors, using the likelihood ratio test of statistical significance (with  $\alpha = .05$ ). Finally, the accuracy of the resulting univariate and multivariate prediction models was assessed by the area under the curve (AUC) statistic, resulting from receiver operating characteristic (ROC) analysis (Mossman, 1994).

Although the case managers were asked to assess violence risk and to report incidents every three months, the length of the follow-up periods varied in practice. In the main analyses all follow-up periods will be included. However, to test the sensitivity of the results to the length of the follow-up period, the analyses will be repeated for follow-up periods up to four months only, to see whether this markedly changes the results.

## RESULTS

### Number of Routine Assessments Realized

The case managers were asked to assess their clients every three months, over a study period of 20 months (from April 1 2003 until December 1 2004). The number of assessments realized differed markedly between clients (range 1–7), with a mean number of 3.4 assessments per client (s.d. = 2.0). Twenty-four clients (29%) were only assessed once. For the others the time between consecutive assessments was 4.1 months on average (range 1–18; s.d. = 2.3), instead of the intended 3 months. This average differed significantly between case managers ( $F = 8.34$ ; d.f. 5,196;  $p \leq .01$ ). Five case managers had an average period between assessments that ranged from 3.4 to 4.6 months, and for one the average time between consecutive assessments was 7.1 months.

In total 285 routine assessments were realized for the 83 participating clients. Nineteen of these assessments (7%) were not based on a preceding interview with the client, primarily because the case manager anticipated that the interview could be too disturbing for the client or for the relationship with that client. Fourteen clients (17%) were never interviewed by their case manager as part of the routine assessment method.

### Reliability of the Routine Assessments

The inter-rater reliability of the routine assessments was studied by having a second case manager or the FPHT treatment coordinator attend the client interview conducted by the client's case manager, and have both raters assess the client independent of each other. For 28 clients a second rater could be found who was well informed about the client's background and current functioning. Single measure intra-class correlation coefficients (ICCs) were calculated, based on the two-way random model. This showed good inter-rater reliability for the HKT-30 clinical subscale (ICC = .74; 95% CI .51–.87) and situational subscale (.82; .65–.92) and for the total number of needs on the CANFOR according to the case manager (.89; .78–.95). Fair inter-rater reliability was found for the final risk judgment (.67; .40–.84), the total score on the HoNOS-MDO (.61; .29–.80), and the number of unmet needs on the CANFOR according to the case manager (.65; .37–.82).



## Concurrent Validity of the Risk Assessments

On one routine assessment for each client, the case managers were asked to rate the clinical and situational risk factors of the client on both the HKT-30 and the HCR-20 (Webster et al., 1997). This showed excellent concurrent validity between these risk assessment measures, with correlation coefficients between the mean scores of the clinical factors of .80 (95% CI .71–.87;  $n = 81$ ) and the mean scores of the situational factors of .84 (.76–.89;  $n = 81$ ).

## Number and Nature of Incidents

For 260 of the 285 routine assessments a subsequent assessment was available, in which the case manager reported on the occurrence of incidents during the follow-up period. The mean follow-up duration was 4.1 months (range 1–18; s.d. = 2.3; median 3.4).

Table 3 shows the percentages of follow-up periods in which different forms of violent or risk enhancing behavior of the client occurred. An incident of violent or criminal behavior was reported for 57 of the 260 (21.9%; 95% CI 16.9–27.0) follow-up periods, and of risk enhancing behavior for 80 (30.8%; 25.2–36.4) of the follow-up periods. In 37 episodes both an incident of violent or criminal behavior and one of risk enhancing behavior occurred.

Table 3. Incidents by clients during follow-up periods ( $n = 260$ )

Incident	Percentage of follow-up periods in which observed
Violent or criminal behavior	
Physical violence	6.2
Verbal aggression	15.8
Non-verbal aggression	4.2
Sexual assault	1.9
Theft	1.5
Property damaging	2.3
Any violent or criminal behavior	21.9
Risk enhancing behavior	
Hard drug abuse	3.5
Soft drug or medication abuse	13.1
Alcohol abuse	13.1
Gambling	1.2
Violating judicial conditions	.4
No show or breaking agreement	15.4
Stopping necessary medication	1.2
Refusal of contact with care	2.7
Absence of client	.4
Self-mutilation or suicide attempt	1.2
Violent/criminal ideation or preparation	1.2
Incidents against the client	1.5
Any risk enhancing behavior	30.8

# Prediction of Violent or Criminal Behavior

The contributions of the static historical risk factors and the periodically assessed dynamic variables in the short term prediction of violent or criminal behavior are described in Table 4. The top half of the table shows the univariate associations of the predictors with the outcome variable, and in the bottom half the resulting multivariate model is presented. The association of an individual predictor with the outcome variable is expressed as the odds ratio (OR), and the accuracy of the resulting univariate or multivariate prediction model is assessed by the area under the curve (AUC) statistic, both with their associated 95% confidence intervals (95% CI).

Table 4 shows that the static historical risk factors and all periodically assessed dynamic variables are significant univariate predictors of imminent violent or criminal behavior by the client, with the exception of the number of unmet needs for care. The professional risk judgment by the case manager, based on risk assessment with the HKT-30, proves to be the strongest univariate predictor, with an AUC of .73 (95% CI .66–.80).

In multivariate analysis, the dynamic clinical risk factors are found to have incremental predictive power, over and above that of the static historical risk factors, in the short term prediction of violent or criminal behavior by the client. Other dynamic measures of current client functioning, such as situational risk factors, psychiatric and social functioning and the number of needs for care, do not contribute to the prediction of violent or criminal behavior, once the influences of historical and clinical risk factors are taken into account. Their significant univariate predictive power overlaps with that of the historical and clinical risk factors. The prediction is further improved, however, by the professional risk judgment, which proves to contribute unique predictive information, over and above that of the risk assessment factors on which it is based. Finally, once the risk factors are taken into account, the number of unmet needs according to the case manager becomes predictive of violent or criminal behavior by the client, although it did not show a significant univariate association with this outcome. In contrast to the other predictors, worse functioning—as indicated by more unmet needs for care—is associated with a reduced risk for violent or criminal behavior by the client.

Table 4. Predictors of violent or criminal behavior

Predictor	OR	95% CI	<i>p</i>	AUC	95% CI	<i>p</i>
Univariate prediction						
Historical risk factors	2.31	1.37–3.93	<.01	.64	.56–.72	<.01
Clinical risk factors	5.51	2.78–10.94	<.01	.72	.65–.79	<.01
Situational risk factors	1.75	1.01–3.03	.05	.58	.50–.67	.05
Professional risk judgment	2.50	1.76–3.56	<.01	.73	.66–.80	<.01
Psychiatric and social functioning	3.54	1.90–6.60	<.01	.68	.60–.76	<.01
Number of needs for care	1.13	1.05–1.21	<.01	.64	.56–.72	<.01
Number of unmet needs for care	1.04	0.94–1.15	.47	.53	.44–.61	.57
Multivariate prediction model						
Historical risk factors	1.53	0.85–2.76	.16	.77	.70–.85	<.01
Clinical risk factors	4.30	1.72–10.73	<.01			
Professional risk judgment	2.16	1.40–3.33	<.01			
Number of unmet needs for care	.80	0.69–0.93	<.01			

The resulting multivariate model has a reasonable accuracy, with an AUC of .77 (95% CI .70–.85).

When the analyses are restricted to follow-up periods up to four months ( $n = 173$ ), the univariate associations of dynamic factors with violent or criminal behavior increase (clinical risk factors to  $OR = 7.38$ ; situational risk factors to  $OR = 1.98$ , and psychiatric and social functioning to  $OR = 5.46$ ). This is reflected in the multivariate model, which is built of the same variables as in the analysis with all follow-up periods, but where the influence of clinical risk factors increases (to  $OR = 5.26$ ), at the expense of the influence of the static historical risk factors (which drops to  $OR = 1.30$ ). The accuracy of the multivariate model increases somewhat to an AUC of .79 (95% CI .70–.88).

### Prediction of Risk Enhancing Behavior

In Table 5 the prediction of risk enhancing behavior by the client is studied, irrespective of the occurrence of any violent or criminal behavior. All measures of current client functioning as well as the client's static historical risk factors prove to be significant univariate predictors of risk enhancing behavior too, again with the exception of the number of unmet needs for care. Surprisingly, the static historical risk factors turn out to be the best univariate predictor of risk enhancing behavior by the client, with an AUC of .72 (95% CI .66–.79). However, in multivariate analysis, current client functioning is found to improve the static prediction of risk enhancing behavior also, although this time the assessment of current psychiatric and social functioning has the greatest incremental predictive power, instead of any dynamic risk factors. As in the analysis of violent or criminal behavior, the univariate predictive powers of the different dynamic measures overlap to a large extent. This time the professional risk judgment does not improve the prediction, but the number of unmet needs for care, as perceived by the case manager, again becomes predictive once all other dynamic and static variables are taken into account, and again in the unexpected direction of more unmet needs being associated with less risk enhancing behavior. The resulting multivariate prediction model proves to be reasonably accurate too, with an AUC of .76; 95% CI .70–.82).

Restricting the analyses to follow-up periods up to 4 months resulted in minor changes to the univariate associations of the predictors with risk enhancing behavior. For some dynamic factors the univariate association increases somewhat, as in the

Table 5. Predictors of risk enhancing behavior

Predictor	OR	95% CI	<i>p</i>	AUC	95% CI	<i>p</i>
Univariate prediction						
Historical risk factors	4.44	2.59–7.61	<.01	.72	.66–.79	<.01
Clinical risk factors	3.52	1.94–6.38	<.01	.66	.59–.73	<.01
Situational risk factors	2.30	1.38–3.83	<.01	.63	.56–.70	<.01
Professional risk judgment	1.59	1.18–2.14	<.01	.61	.53–.69	.01
Psychiatric and social functioning	3.21	1.82–5.65	<.01	.68	.60–.74	<.01
Number of needs for care	1.10	1.04–1.17	<.01	.63	.56–.70	<.01
Number of unmet needs for care	1.02	0.93–1.12	.69	.55	.48–.63	.17
Multivariate prediction model						
Historical risk factors	3.71	2.09–6.58	<.01	.76	.70–.82	<.01
Psychiatric and social functioning	3.70	1.73–7.93	<.01			
Number of unmet needs for care	0.84	0.72–0.97	.02			

prediction of violent or criminal behavior (e.g., situational risk factors increases to  $OR = 2.68$ ; psychiatric and social functioning to  $OR = 3.50$ ), but for clinical risk factors it decreases (to  $OR = 3.15$ ), as for the static historical risk factors (to  $OR = 4.15$ ). The composition of the multivariate prediction model is unaffected by the restriction in follow-up period, but again the influence of dynamic variables (in this case psychiatric and social functioning) increases somewhat (to  $OR = 3.97$ ), at the expense of the static historical risk factors (to  $OR = 3.61$ ). The accuracy of the multivariate model, however, remains the same as for the unrestricted analysis ( $AUC = .76$ ; 95% CI .69–.84).

## Experiences of Case Managers with the Method

The group interview with the case managers at the end of the study showed that the case managers valued the information provided by the routine violence risk assessment method, but were critical about the amount of extra work it meant for them. The case managers especially appreciated how the method sometimes helps to clarify unspecified hunches of risk ('something fishy'), by systematically detailing the factors that could contribute to this risk. The method makes explicit where the problem lies and where care should focus on. Furthermore, the case managers reported that the routine assessments sometimes led to a higher appraisal of risk than expected beforehand, thereby alerting them to points of concern. The topics addressed in the assessments were not new for the forensic care the case managers provided, but could have become unconsidered in contacts with a particular client. Being forced to ask about these topics once in a while sometimes led to unexpected information, and asking about these topics in the context of working through a checklist makes it easier to inquire about sensitive subjects. Furthermore, recidive offences are not seldom of a completely different nature to the offence the client came into treatment for. This too underscores the need to keep evaluating client functioning in a broad range of areas. Finally, according to the case managers, using the routine violence risk assessment method has a function in signaling to the outside world that the service takes the forensic aspects of its work seriously.

However, as reported, the case managers found working with the routine violence risk assessment method rather demanding. It consisted of a three-monthly interview with the client, and rating the client afterwards on several instruments. In particular, the necessity to repeat it every three months was considered too frequent for clients who were reasonably stable in their functioning. This demand was necessary for research purposes, but probably could be—and in practice was—dealt with pragmatically in everyday care.

## DISCUSSION

The present study tested whether routine monitoring of violence risk is feasible and informative in community forensic mental healthcare. The violence risk assessment method we developed proved to meet both requirements.

All participating clients could be assessed with the new method, although for 17% of the clients this was not based on a preceding interview. In these cases the case manager decided to refrain from interviewing the client, most likely because the case manager anticipated that it would be too upsetting for the client or for the relationship with the

client. Furthermore, the time between consecutive assessments was not 3 months—as intended—but 4.1 months on average, and 29% of the clients were only assessed once. This probably shows that the case managers took the liberty to adapt the frequency of assessment to the demands of the situation. As noted, the case managers believed it was not necessary to assess stably functioning clients every three months. Finally the feasibility of the new method is challenged by the fact that the case managers considered the method to be rather demanding. In this respect it is good to notice that the different measures incorporated in the method showed substantial overlap in their predictive value for violent or risk enhancing behavior. This redundancy offers opportunities to simplify the method, without losing much of its predictive power. In spite of the above limitations, however, the vast majority of clients were assessed regularly by their case manager, showing that routine violence risk assessment is feasible in community forensic mental healthcare.

The method also proved to be informative, both according to the evaluation by the case managers and the analysis of its predictive validity. The latter showed several important findings. First, violent and risk enhancing behavior by outpatient forensic clients in the next months can be predicted to a reasonable extent by the combination of one-time assessment of static risk factors and repeated assessment of dynamic factors incorporated in the method, with areas under the curve of .77 (95% CI .70–.85) and .76 (.70–.82) respectively.

Second, dynamic risk factors have an incremental predictive value to static risk factors in the short term prediction of violent or criminal behavior, and general psychiatric and social functioning in the short term prediction of risk enhancing behavior. Similar results for violence prediction were obtained by Doyle and Dolan (2006), but not, for example, by Gray, Taylor, and Snowden (2008). The latter note that these differences may depend on the distribution of the risk factors in the particular study population and on the length of the prediction interval. Dynamic risk factors may not be expected to be predictive over long follow-up periods, because the factors may change in the mean time, underscoring the need to reassess dynamic factors regularly. This is also seen in the present study, where restricting the length of the follow-up period tended to increase the predictive power of dynamic factors, at the expense of that of static factors. In addition, retrospective assessment of dynamic factors by researchers (as conducted by Gray et al., 2008, and many others), which is based on—probably limited—file information about the patient's functioning at that particular time, may be qualitatively different from the real time assessment by the treating clinician, advocated here. It may be different with respect to the information available to the assessor, the likelihood of bias due to the direct interaction between assessor and assessee (Philippe, Koeter, Van der Staak, & Van den Brink, 2006), and the opportunity to influence the predicted outcome by taking risk management measures (Douglas & Kropp, 2002).

A third finding of the present study is that the professional judgment of case managers based on structured risk assessment adds predictive value to their scoring of risk assessment factors in the short term prediction of violent or criminal behavior by outpatient forensic clients. This finding corroborates the Structured Professional Judgment approach (Douglas & Kropp, 2002; Webster et al., 1997), which deliberately gives the assessor the opportunity to weigh the particular constellation of risk factors as well as any idiosyncratic risk factors for the client in his or her final professional risk judgment. Previous studies also showed such an incremental predictive validity for the final risk judgment (De Vogel & De Ruiter, 2006; Douglas, Ogloff, & Hart, 2003).

Fourth, once static and dynamic measures of risk and current functioning are taken into account, the number of unmet needs for care of the client—as perceived by the case manager—becomes predictive of violent and risk enhancing behavior, in such a way that more unmet needs for care are associated with a reduced chance of problematic behavior. It may be speculated that in these cases the unmet needs for care, as identified by the case manager, signalize that the case manager sees opportunities to do something about the observed risk. That is, the case manager sees opportunities to offer care for unattended problems, and this may be a more favorable situation than when the case manager perceives the same static and dynamic risk factors, but sees no opportunity to improve the client's situation. This would take the use of risk assessment instruments beyond mere prediction, and would make them into tools for risk intervention. Of course this unexpected finding should first be confirmed in other studies. But it is remarkable that the phenomenon is seen in both the prediction of violent or criminal behavior and in the prediction of risk enhancing behavior.

Some limitations of the study should be mentioned. First, the study was only conducted in a specific group of clients—those who receive forensic psychiatric home treatment—and in a limited number of services operating in a specific region of the Netherlands. These clients and services may not be representative of outpatient forensic clients receiving other forms of outpatient forensic care from services elsewhere. Differences in judicial and financial arrangements may make groups of forensic clients seen in different countries and services incomparable (Salize & Dressing, 2005). However, this study showed that routine violence risk assessment is feasible and informative, at least in the particular group of clients and services studied, and other studies should test whether this hypothesis also holds for other groups and services.

In addition, the validity and reliability of the incidents of violent or risk enhancing behavior reported are unclear. The incidents were only assessed using one source of information, the client's case manager. Other studies showed that assessment of violent behavior by different sources, for example client self-report, collateral report, care records, and judicial or police records, may give marked differences in the number of incidents reported (Doyle & Dolan, 2006; Steadman *et al.*, 1998). We only asked the case manager, but we did this on a regular basis, to sensitize the case manager to collect relevant information from available sources (e.g., the client, relatives, social agencies, and probation officers). Additional methods of assessment, such as regular interviews with the client or a collateral, were expected to influence the care process too much. Finally, we included what could be considered 'mild' forms of problematic behavior, such as aggression, and mere risk enhancing behavior. This may limit the immediate societal impact of the behavior studied, but it incorporates signals that are very relevant for case managers to monitor treatment progress in their outpatient forensic clients. Furthermore, this is the outcome information that is available in practice, and with which the clinician has to work.

The method of routine violence risk assessment we developed is an operationalization of the 'prevention based paradigm for violence risk assessment', suggested by Douglas and Kropp (2002). They remind us that the ultimate goal of risk assessment is violence prevention, not prediction. To reach this goal, they emphasize the need to thoroughly integrate risk assessment in patient care, in such a way that observations of crucial risks for the individual are directly translated into risk management and treatment interventions, addressing these risks. Douglas and Kropp (2002) speak of an 'ongoing risk reassessment and management revision process' to accomplish this. We



incorporated these suggestions in the routine violence risk assessment method, studied here. The case managers were asked to discuss every three months with their clients the clients' functioning, needs for care, and satisfaction with care, using the CANFOR. This was modeled after a method of structured patient–clinician communication that showed positive effects on patient outcomes in community mental healthcare (Priebe et al., 2007). After the study presented here, we further strengthened the link between risk assessment and care evaluation, by incorporating the method of routine violence risk assessment into the process of care plan evaluation. Formal care plan evaluation by the clinician and client is obligatory in the Netherlands at least once a year, and may in addition occur at moments of significant change in the client's functioning or situation. Furthermore, we replaced the discussion on client needs for care based on the CANFOR by a discussion between the case manager and client directly addressing the client's risk and protective factors for violence or criminal behavior, using a new instrument, the Short Term Assessment of Risk and Treatability (START; Webster, Martin, Brink, Nicholls, & Middleton, 2004). The START also replaced the HoNOS-MDO and HKT-30 as the instrument for the case manager to assess client functioning and dynamic risk factors. This substantially simplified the method, as desired by the case managers, and is in keeping with the redundancy found in the predictive values of the instruments used. We denoted this adapted method the Risk Assessment and Care Evaluation (RACE) method, to underscore the full integration of risk assessment and care planning. Currently we are conducting a randomized clinical trial (the RACE study; trial number 1042 at [www.trialregister.nl](http://www.trialregister.nl)), to test whether employing the method actually prevents violence in community forensic mental healthcare.

In conclusion, the present study showed that the violence risk of outpatient forensic clients can be assessed regularly, as part of routine clinical practice. It is predictive of violent and risk enhancing behavior in the subsequent months, and it can inform about any needs for risk management or treatment. Whether this helps to actually prevent violence is as yet unclear.

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